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ABSTRACT

The chapters in this book, developed from presentations made at the Annual Conference of the Australian College of Education in Canberra, explore the theme of a sustainable society and the role of education. In the first part, five writers explore the meaning of "sustainable society." Sir Ninian Stephen, Ian Lowe, and Janet Hunt argue that sustainable development is the most important item of the political agenda and that education's crucial task is to alert the collective national consciousness. Mandawuy Yunipingu and Miriam-Rose Ungunmerr-Baumann elaborate by drawing on past lessons that offer a message of hope. In part 2, Cherry Collins and Josefa Sobski examine the role of education in shaping attitudes and modelling good environmental practice. Prominent Australian educators--Susan Ryan, Frances Christie, and Barry Dwyer--move from the present to the future in the third part. All contributors agree that education for a sustainable society is a major responsibility for schools, TAFE colleges, universities, and all educators. (LMI)

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EDUCATION FOR A SUSTAINABLE SOCIETY

The Australian College of Education

EDUCATION FOR A SUSTAINABLE SOCIETY

Papers presented at the
31st National Conference
of the
Australian College of Education
Canberra, 1991

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1992

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Education for a sustainable society

There is a story told of a lily growing in a pond. Each day the lily doubled in size and as it grew bigger and bigger it threatened all other life in the pond. On the twenty-ninth day it covered fully half the pond, and the question began to be asked whether it should be pruned. Without being alarmist, the same question could be asked now. What day is it and what steps are we taking to ensure quality of life on this planet for those who follow?

It is these kinds of questions that are taken up in this book, questions that must surely rank as the most important facing nations around the globe. The analogy with a pond is very real for, as numerous phenomena and events testify, what happens in one part of our world ricochets in other parts, in sometimes predictable and at other times often unpredictable ways. For the first time in our history – the twenty-ninth day perhaps – questions about our habitats, our networks, our total way of living and working, need to be faced collectively by people and governments everywhere. In the words of a well known song, *it's a small world after all.*

Sir Ninian Stephen, Ambassador for the Environment, tells in the first chapter of the Earth Summit to be held in Brazil in June 1992. In terms of number of nations attending (it is expected that leaders of 150 nations will be present), the Summit dwarfs to insignificance the Treaty of Versailles negotiated by 32 countries and the signing of the Charter of the United Nations by 50 countries. Perhaps, significantly, children from around the world plan to meet simultaneously

in Rio de Janeiro to grapple with the world's environmental problems. Australia's representative is May Eshraghi, a Year 7 student from Koonung Secondary College in Melbourne, who believes "there is a very small light at the end of the tunnel" and is hopeful that it will not go out. "We must never give up on the environment," she said when interviewed.

The chapters in this book, reworked from presentations at the Annual Conference of the Australian College of Education in Canberra, explore the theme of a sustainable society and the key role to be played by education. The book has three parts. In the first, five writers tease out what is meant by the term, *a sustainable society*. Sir Ninian Stephen, Ian Lowe, and Janet Hunt, coming from different standpoints, argue that sustainable development is the most important item on the political agenda and that the crucial task for education is to alert our collective national consciousness. Mandawuy Yunipingu and Miriam-Rose Ungunmerr-Baumann fill out the picture by drawing on lessons from the past. Their message is one of hope.

The second section takes up the theme, and here Cherry Collins and Josefa Sobski begin to examine the role of education in shaping attitudes and modelling good environmental practice. As in a relay race, the theme is further explored in the third section of the book where other prominent Australian educators – Susan Ryan, Frances Christie, and Barry Dwyer – move from the present to tomorrow. All contributors agree that education for a sustainable society is a major responsibility for schools, TAFE colleges, universities, and all educators.

The National Council of the Australian College of Education is grateful to the conference organisers, Ron Lane and Denis Sleigh, for bringing together the group of thinkers whose words and ideas are presented here. Their's is the beginning of a conversation, a conversation in which we are all invited to join for it concerns our common future.

Jonathan Anderson May 1992

1 What do we mean by a sustainable society?

Sir Ninian Stephen

The term *sustainable development* has been much used in recent years, perhaps even over-used to the point of becoming banal to the public at large. Many other nouns can and are substituted for the original noun *development* depending on the priorities of the user. This book contains in its title the term *sustainable society* – we have heard of *sustainable lifestyles* and there are many other *sustainables*, now in common use from agriculture to urban growth, from forestry to populations, and so on. However, they all involve, to a degree, *development* that peculiarly human trait, economic or social or, as it most often is, a combination of the two. We constantly strive to improve the quality of our lives as a society. Therefore I will concentrate on sustainable development, hoping that in doing so some light may be cast on the concept of a sustainable society.

Of course, the key to achieving any sort of sustainability is education, and it is on this that subsequent chapters focus.

Few would question the concept of sustainable development and the need for it to be supported and nurtured by an educated and informed society, a society not only acutely aware of the limitations on the capacity of nature and the earth's resources to provide the necessities of life but also possessing the wisdom to manage those resources properly .

In this century's final decade, we are at something of a crossroads. It is the human species and only the human species that has developed the technical capacity and the skills to change the physical face of the earth. Our lack of knowledge and of wisdom in the past has been a root cause of the environmental deterioration now being visited upon many societies in many parts of the world. So far we have had the wisdom to draw back from the brink of disaster when a product of mankind's intelligence threatened us all with nuclear destruction, as it did during the darkest days of the cold war. The threat to human societies' well-being presented by environmental degradation is no less critical – and is only the more insidious because it is less immediately obvious and the options, the choices, are less stark. Despite this, the wisdom to make intelligent and informed decisions about our future and that of all living things must not desert us now, when the future of future generations depends on the making of those decisions.

There is nothing very new or startling to be said, following this line of reasoning, about defining *sustainable development* or for that matter a *sustainable society*. The logic of the above suggests that one can accept the definition offered by the report of the Brundtland Commission, The World Commission on Environment and Development (1987), in its seminal report, *Our Common Future*. That report, characterised sustainable development as being that development which "meets the needs of the present without compromising the ability of future generations to meet their own needs."

Here in Australia we use the phrase *ecologically sustainable development*, which adds emphasis but does not alter meaning. Ultimately, the words we choose may not matter very much. What does matter is that we in Australia, as well as societies world-wide, understand what it is about social and economic lifestyles that has led to the present deterioration of the natural environment, that we know what has to be done to convert it, and that we have the determination to carry though with the measures that are necessary. It is precisely with this in view that here in

Australia nine ecologically sustainable working groups have been set up. The final reports of the groups are due for publication very soon.

It is highly unlikely that everyone will agree with the findings of the ecologically sustainable development process but it cannot be said that the exercise has been wasted or unnecessary. If anything, it was overdue because the concept of ecologically sustainable development predates the Brundtland report by some 15 years – it first came to prominence at the UN Stockholm Conference on the Human Environment in 1972. This was the conference that created the United Nations Environment Program, UNEP, which, ever since, has played a catalytic role in identifying nature's warning signals – spreading desertification in Africa, problems in marine and freshwater environments, the threat of global warming, the alarming loss of biological diversity, to name a few.

In 1980 UNEP, together with the IUCN (the International Union for the Conservation of Nature and Natural Resources) and WWF (the Worldwide Fund for Nature, formerly the World Wildlife Fund) published the world conservation strategy which was subtitled *Living Resource Conservation for Sustainable Development*. That strategy provided a sound intellectual framework and practical guide for national living resource conservation planning strategies around the world and, thus aided, Australia produced a national conservation strategy in 1984.

Then in 1987 came the Brundtland report which refined the definition and gave new impetus to, and a popular appreciation of, the urgent need for environmentally sound and sustainable development in all countries. In Australia the report led to a reappraisal of our situation on matters environmental, both domestically and in terms of our regional and international relations and obligations. In July 1989 the Prime Minister issued a wide ranging statement, which initiated the ecologically sustainable development process. And globally, the Brundtland report has been the inspiration for the United Nations Conference on

Environment and Development (UNCED) to be held in Brazil in June 1992.

So twenty years on from the Stockholm Conference the international community is trying to regain a momentum which seemed to have been lost during two decades of economic booms and busts and of cold war which managed to distract, to a degree, world attention from the ominous and relentless deterioration of the global environment. Stockholm itself had been a response to increasing concern about what were then seen as largely localised issues of industrial pollution and water quality problems in industrialised countries. Not until the early 1980s did the environment, as an international political issue, re-emerge, this time with a particular focus on developing countries as many of them rapidly attempted to industrialise.

The Brundtland report of 1987 was a landmark. Its novelty was that it recognised that developing countries would not forego what they saw as their right to economic development and certainly would not do so in response to overtures from developed countries which, with the benefit of hindsight, were now realising the global environment threat of unsustainable development. Nor would they respond to calls from environmental groups in the developed world for an end to growth. In calling for accelerated economic growth, anathema to some in the environment movement, the Brundtland Commission report recognised the intrinsic cause and effect relationship between poverty and environmental degradation and between poverty and lack of development. However, the report was categoric in its insistence that economic growth, development, if it was to be at all sustainable had to be integrated with environmental concerns, had to be fundamentally reorientated towards quality and efficiency, all that was implicit in the notion of sustainable development. All this seemed radical at the time but, when the report was presented to a special session of the UN General Assembly, it was endorsed unanimously and without qualification. With that, the world accepted the principle of sustainable development.

And so to UNCED, the UN Conference on Environment and Development. Just as the Brundtland report was a catalyst in popularising the idea of sustainable development, so too will the 1992 conference in Brazil be a catalyst if it succeeds in gaining global acceptance of the principles, declarations and binding obligations which will be the foundation of sustainable development in practice – the template which will guide the integration of development and the protection of the ecological processes and of earth's natural capital for decades to come.

The third preparatory committee meeting for UNCED has concluded. While all participating countries, committed as they are to the objectives of UNCED, accept that sustainable development is the way of the future, there are differing views as to how it should be achieved. As leader of the Australian delegation to UNCED, I have been involved in the negotiations from their beginning in Nairobi in August 1990. The one overriding impression I have – and this only bears out Brundtland's prediction – is that developing countries will resist, without compromise, any threat to their economic well being and ability to fight poverty from those whose primary concern is the protection of the global environment.

For countries such as India and China – and I name them in particular because their views carry substantial weight at these negotiations – the primary concern in UNCED is economic, not environmental. These countries, and others sympathetic to their views, negotiate consistently to obtain from the developed world the funding and the transfer of technology on concessional terms which they believe their peoples need as *quid pro quo* for entry into the conventions, the declarations, and the global action plans that it is hopeful UNCED will produce.

The issues for UNCED are extraordinarily complex and extend far beyond what we have come to think of as peculiarly matters of environmental concern. They involve many aspects of trade and trade access, industry and energy and transportation policies, agriculture and fisheries, the role and status of women, the interests of indigenous

peoples and the whole intricate web of connections between them all. Really what is involved is recommendation of the functioning of societies world wide.

There is risk that the negotiations could collapse into a morass of political polemic and impractical rhetoric. But the signs are hopeful. The hope must be that we do not see the re-emergence of the old north-south debate. Too many developing countries are now having to confront the formidable environmental outcomes of inappropriate development models of the past, declining resource bases (particularly soil in agriculture dependent economies), mushrooming cities, frighteningly expanding populations, and grinding poverty – all with devastating impact upon the environment. Representatives of 160 countries and more than 300 non-government organisations came to the third PREPCOM in Geneva with an encouraging sense of urgency knowing full well that an enormous responsibility was riding upon their efforts.

Despite the signs of hope, none of us should be in any doubt that the period leading up to the Brazil Conference will be a time of extraordinarily difficult international negotiations as the preparatory work for UCNED continues and as the complimentary negotiations for climate change and biodiversity conventions progress. The Government will have to draw increasingly on a sophisticated public understanding of issues and of how they connect one with another. In essence, I refer to a good public understanding of both the opportunities and the limitations of the UNCED process itself and, as well for Australia, both the opportunities for us implicit in the process and the limitations imposed by our geography, demography and the nature of our economy.

We can expect that all nations that are signatory to UNCED derived conventions and declarations – and that includes Australia – will in all probability, face a future in which environmental considerations will play a major policy role. And this will apply not only to governments but to industry and commerce and legal and technical institutions within each country. Patterns of world trade and the shape

of domestic economies alike are going to be affected by these considerations. Whole new areas of international law will come into existence as international environmental conventions take shape and require implementation, monitoring and enforcement mechanisms.

The implications for Australia are obvious enough. Our continent has a natural vulnerability to the effects of global environmental phenomena such as climate change. Many countries look to us as one of the very few developed countries that, in biological terms, is mega-diverse. Our efforts in conservation and technical appreciation of our own biodiversity could have repercussions far beyond our shores. So, our interest from a purely environmental standpoint is without question.

But Australia's national economy is also extremely vulnerable – vulnerable to protectionism, vulnerable to growing environmental sensitivities in countries which receive our major exports such as coal, vulnerable to the immense distances between us and our export markets, and vulnerable because of the energy intensive nature of our economy. Protection of our interests from an economic standpoint is therefore, without question, at issue as well. Because of that vulnerability, Australia must keep pace with international developments and maintain the capacity to read accurately the trend of current negotiations. Our continued well-being depends on it.

As will so much else in the way of human endeavour, an understanding and appreciation of the practical implications of sustainable development, or the realisation of a sustainable society, will be dependent upon the education that our children receive. To an extraordinary degree, a sustainable future will depend upon the next generation or two of decision makers – those now in senior secondary and tertiary institutions. Over the past decade or so, we have come to realise the folly of neglecting the environmental implications and effects of our economic and social decisions. It will be the role of succeeding generations to continue to solidify that process and ensure that the environment is never again ignored.

For the federal government, environmental studies is a priority in higher education. Environmental studies has been added to the list of existing priority areas. The Australian Research Council has an important role to play as do the cooperative research centres announced by the Prime Minister at the last election. Educating for a sustainable society must surely be one of the most exciting challenges educators in this or any other country will face over coming years.

In other areas of its activities, the Government has accepted sustainable development as a central criterion against which policies are formulated. As early as 1984, the Jackson Report on Australian overseas assistance, established sustainable development as a key objective of Australia's development cooperation program. In 1990, AIDAB, our International Development Cooperation Agency, published an interim policy statement in which it recognised that the challenge before it now is to integrate the ecological aspects of sustainable development fully into its program.

Technical agencies involved in international cooperation, CSIRO and the Australian Centre for International Agricultural Research, for example, have a long history in practical implementation of the theories embodied in sustainable development – and again, long before the term gained popular currency. The Great Barrier Reef Marine Park Authority is another agency widely respected and experienced internationally, precisely because its management methods were explicitly designed according to ecologically sustainable development principles.

The international community will shortly, it is hoped, have made at UNCED explicit commitment to pursue human development according to sustainable development principles. More than two years of difficult diplomacy, often fractious negotiations and literally millions of words and a mountain of paper should, at least, have got us that far. Yet even then, the understanding and, much more importantly, the application of those principles will not be universal. It will be for us to elaborate, in practice, what they mean in

Australia and for us, where we can, to offer our assistance and technical expertise to developing countries, particularly those that are the custodians of previous or threatened ecosystems.

And when the diplomacy is done and the last words spoken, it will be the practitioners, whether scientists, engineers, educators or policy makers, indigenous or agricultural communities or transport planners and users in our large energy-hungry cities who will make sustainable development, and indeed a sustainable society, actually work. As never before, we will need people with the strength of vision and commitment to see that monumental task through. These are the people in schools and universities now, those who will go on better informed and equipped than ever, to teach future generations. This is the responsibility for education.

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2 What is sustainable development?

Ian Lowe

The publication of the influential book *Our Common Future* (the Brundtland Report) by the World Commission on Environment and Development (1987) stimulated a long-overdue debate on the need to reconcile economic development with protection of the natural world. The aim of sustainable development is to make economic development compatible with protection of the natural environment by integrating economic and environmental considerations. Although the idea of sustainable development has been widely misunderstood and sometimes deliberately misused, there should be general support for its basic aim of meeting the needs of the present without compromising the ability of future generations to meet their own needs. This is the central political issue of our time: as the Brundtland Report said, unless our economic decisions are ecologically rational we will be unable to maintain our current living standards, let alone improve them.

Defining sustainability

At last count, some 75 attempts to define sustainable development had been identified! For the purpose here, I use the term to mean a pattern of activities which can continue for the foreseeable future. This seems to me the simplest and best definition: sustainable development is a pattern of activities which meet the needs of this generation

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without prejudicing the ability of future generations to meet their needs. This criterion imposes at least four conditions:

1 there must not be unreasonable depletion of any resource;
2 there must not be significant damage to the eco-system;
3 there must be no significant decline in social stability;
4 the sustainability of other societies must not be harmed.

The first two of those conditions appear self-evident. An activity would not be sustainable if it were depleting natural resources at a significant rate, or if it were causing severe damage to the natural eco-system. Of course saying that, begs important questions about what level of depletion of a resource is significant, or what degree of damage to natural systems is acceptable. Given the current limits of our understanding, these are still essentially value judgements.

Taking the example of resource depletion, most people would agree that the current mining operations in the State of Tasmania are not sustainable, as the major mines are all likely to close within fifteen years. On the other hand, it would be possible to continue to extract coal from this country at the current rate for centuries, so that activity might well be seen as not significantly depleting the resource.

The same sort of value judgement is involved in deciding whether the ecological damage of an activity is acceptable. Most people agree that depleting the ozone layer and changing the global climate are not acceptable activities; at the other end of the scale, the loss of an individual tree might be acceptable. Somewhere between these extremes, we each draw our individual line in the sand. Politicians try to divine the changing collective will of the electorate in resolving such difficult issues as whether logging on Fraser Island or mining at Coronation Hill should be allowed to proceed, weighing against the real or alleged environmental damage the real or alleged economic benefits. The judgement is made more difficult by the uncertainties in both environmental and economic impacts.

The third and fourth conditions are often overlooked, but are just as important as the tangible criteria of resources and

waste. An activity would not be sustainable if it undermined the stability of society, even if the resource depletion rates and environmental impacts were acceptable. Similarly, an activity which was potentially sustainable within Australia but threatened the stability of other states or other nations should also be avoided. As a concrete example, if it were to happen that Australia and Indonesia each planned to use the oil which might be found under the Timor Sea to supply their future liquid fuel needs, there would be an obvious potential for conflict. While it might be unnecessarily alarmist to think that access to oil could be a cause for international conflict, there is a recent example to spark such anxiety!

Moving toward sustainability

There are a range of options to meet the need for a move to sustainable practices. Consider the specific problem of finding ways to heat a house in winter without using electric radiators, the technology still used in many Australian homes. One conceivable response to concern about unsustainable practices would be to stop heating the house and quietly freeze. I do not predict this to be a popular answer. A second possible response would be to retro-fit conservation technology, such as insulation, thus reducing the rate of heat loss from the house and therefore cutting the amount of energy needed to maintain a comfortable temperature. A third option would be to move to a more efficient technology for supplying heat, such as a heat pump (more commonly called a reverse-cycle air-conditioner).

A fourth approach would be to review the level of energy use, for example, by accepting a lower internal temperature and wearing warmer clothing. Finally, it would be possible to consider changing to a fuel with less environmental impact, such as natural gas, or a potentially renewable fuel, such as wood. In this example, there are at least five distinct approaches to the problem of making the heating of the house more like a sustainable activity. The choice will depend on the relative costs of the alternatives, which in turn depends on the heating needs of the area concerned.

Those who live in Oberon or Deloraine do not have the same heating need as the people living in Cairns or Darwin!

There are three distinct ways of achieving changes in the way we use resources. Change can be mandated by legislation or regulation by the government. Change can be induced by economic incentives, either rewards for behaviour which is to be encouraged or penalties for activities which are to be discouraged. Finally, change can occur as a result of alterations in social attitudes; a good example is the increasing volume of newspapers being offered for recycling by Australian householders, in the absence of any regulatory provisions or economic inducements.

What is to be sustained?

Before we can develop a strategy for sustainable development, we must ask the fundamental question: what do we wish to sustain and for whom do we wish to sustain it? The most basic answer to that question is, as suggested above, that we wish to sustain a healthy and diverse eco-system on behalf of existing and future generations of humans and other species. To achieve this, it has been suggested that we need to sustain bio-diversity, ecological integrity and "natural capital".

Bio-diversity

Bio-diversity refers to the variety of species, populations, habitats and eco-systems existing on the Earth. There are sound practical and moral reasons for seeking to maintain bio-diversity through such measures as the reservation of representative eco-systems and habitats, as well as the protection of endangered species and populations. On the practical side, such protection provides a stock-pile of genetic diversity for potential use in medicine and agriculture, this is especially important in the face of expected changes of climate. It also enables scientific study of species and properties we do not yet understand, improves the chances of eco-systems being stable in the face of climate change and assists to absorb atmospheric gases emitted by human activity. Perhaps equally importantly, it

provides places for rest, recreation and (where appropriate) tourism; we should not under-estimate the psychological value to humans of wilderness areas which are not exploited for economic gain.

In moral terms, such protection recognises that humans share this planet with countless millions of other species. While protection of bio-diversity undoubtedly enhances human welfare and is desirable in those practical terms, we should also recognise that other life-forms have intrinsic value and some right to exist, whether they are useful to humans or not.

Ecological integrity

Ecological integrity refers to the general health and resilience of natural life-support systems. This includes the ability of eco-systems to assimilate wastes, such as pollution of air, water or soil, through basic natural cycles: the water, carbon and nitrogen cycles are obvious examples.

It also includes the ability of eco-systems to withstand other stresses, such as climate change or depletion of the ozone layer. The effects of a growing human population combined with increasing use of fuel energy and other resources has seriously impaired the ability of the natural eco-systems to provide these *free services*. The maintenance of the integrity of eco-systems will require a concerted local, national and international effort to increase energy and resource efficiency, encourage clean technologies and impose rigorous pollution standards.

Constant natural capital

Maintaining a constant natural capital stock of productive soils, fresh water, available renewable resources, and so on, is essential even for the survival of human communities. Natural capital is clearly an important indicator of the well-being of a community. The simplest interpretation of this criterion is that a society should live on the *interest* provided by the natural capital stock. Thus renewable resources should only be harvested at a rate which is sustainable: no greater than the rate of natural replenishment. Given our

imperfect understanding of eco-systems, we probably should err on the side of caution in this calculation.

In terms of non-renewable resources, we clearly should take a cautious long-term perspective, maximising the options which will be available to future generations. That means we should use non-renewable resources at a rate no greater than it is possible to find substitutes. Alternatively, we possibly should think in terms of compensating future generations for the depletion of resources, for example by using the funds generated to develop renewable resources.

This suggests a softer requirement. The depletion of natural capital often involves the creation of human capital, as we cut down a tree for timber which is turned into a table. It is reasonable to argue that the depletion of natural capital is acceptable, provided that the resulting human-made capital is a reasonable compensation.

After all, the devices for harnessing renewable forms of energy usually need some natural resources: iron, copper, aluminium and fuel minerals. It should be noted, however, that even this weaker form of the criterion requires an auditing of the depletion of natural capital resulting from economic activity; without such an audit, we cannot say with any confidence that we are meeting our obligation to maintain the overall stock of (natural plus human-made) capital.

An organising framework

To achieve ecologically sustainable development, we need to use ecological principles as the organising framework within which social and economic decisions are made. Since it is also clear that some groups within society have benefited more than others from practices which cannot be sustained, it is necessary to develop ways of compensating those who are most disadvantaged by the transition to a sustainable society. As the Brundtland Report (World Commission on Environment and Planning 1987) has shown, clearly the link between poverty and environmental degradation, the eradication of poverty is clearly an essential part of the transition to a sustainable

society. Thus the arrangements for managing that transition should be used to redress the current extreme differences in access to *environmental goods* within our society. The sustainable society must incorporate equity within this generation as well as equity between generations.

Thus the formulation of a development strategy that aims to sustain bio-diversity, ecological integrity and the stock of natural capital should:

1 recognise the primacy of ecological considerations;
2 adopt a cautious approach to assessing risks;
3 ensure social equity within and between generations;
4 cultivate a long-term, global orientation;
5 maximise efficiency of using resources and energy; and
6 encourage public participation in the making of decisions.

A digression on population

It may be thought to be such an obvious point that it need not be explicitly mentioned, but a sustainable society implies a stable human population. Births regularly exceed deaths in Australia by about 120,000 each year, and government policy is generally seen as supporting this population increase. At the very least, there should be public discussion of the target population for the country, recognising that continued growth will place continually increasing strain on natural systems, all other things being equal.

This is certainly not a specific argument against our traditional immigration policy because there is no reason to suppose that immigrants make more demands on the natural resources of Australia than those of us who were born here. In fact, most immigrants come here from cultures which are less resource-intensive and take some time to adopt our lifestyle, so the average migrant probably places less strain on the natural systems than those born in Australia. That being said, the level of immigration is clearly one of the key factors which currently produces a rate of population increase which is one of the fastest in the developed world. The question of the level of population which can be sustained needs to be examined in parallel with the ecological impacts of the lifestyle we lead.

Conclusion

All aspects of modern life use resources and impact on the natural world. This is true of our food, our housing, our work patterns, our transport systems, even our recreation. As responsible citizens, we need to think about the impact of what we do on the options available to future generations. Most of us would like our grand-children to have at least as wide a range of life choices as we have. I think we would make much wiser decisions about a wide range of issues if we always asked ourselves one question: what will our grandchildren think of our choice? Will they be impressed by our unselfishness and our far-sighted view, or will they be appalled by our myopia and selfishness? The need to attempt to treat future generations equitably imposes a strong moral duty to move toward a pattern of development which is truly sustainable.

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3 Defining a sustainable society

Janet Hunt

I start with the assumption that the current way of organising society is not sustainable. The following quotation from a book written by a colleague who works in OX-FAM, UK supports this view. John Clark (1991) says this:

> Today's economic orthodoxy is a path not to development but to disaster. It is stripping the planet's mantle of its natural resources and diversity. It is casting millions upon millions into abject poverty. It brings haemorrhaging of money from poor countries to rich on a scale that eclipses the more naked extraction under colonialism. It is polarising the already obscene wealth gaps, both between individuals and nations. And it is blind to the multiplying abuses of human rights and cultural integrity.
>
> It is a path to disaster because it sacrifices the weak for the pleasure of the strong, and it sacrifices the future for the pleasure of today, and it sacrifices moral and spiritual values for the monetary values of the cash register. It exacerbates both greed and resentment, and so sets peoples and nations against each other rather than encouraging co-operation.

How can we avoid the path to disaster?

First, we have to *really grasp* it. I do not see much evidence that we have grasped it. I see some minor shifts in the behaviours of a few people – people who, at a minimum,

recycle their paper, tins, glass bottles, and whatever plastic they can; people who use bicycles or buses as much as possible; people who eat little or no meat and eat more grains and vegetables which use less energy to produce; people who compost all their organic wastes and grow at least some of their own food; people who take string shopping bags and refuse plastic ones; people who take short showers and turn off lights and other electrical appliances when they are not needed, and so on. These are all important steps which each of us can and must take immediately. But they are only a beginning, and there are too few people taking even these seriously.

But the transformation needed is far deeper than that. It is a transformation in our thinking, our institutions and our whole approach to development. If we could only grasp a few dimensions of the crisis facing the world we would realise that the model of development adopted by the developed world is neither desirable, nor possible for everyone on the planet. But we cannot be the arbiters of who will live in material wealth and who will be poor. Australians have to live in a manner which could be sustained by all the inhabitants of this fragile planet. That is the only morally defensible, as well as practical position. We have to grasp the challenge of changing our own society, urgently. What are some of the indicators of the need for such change?

1 Currently human beings as a species use 25 per cent of the net photosynthesis produced from energy captured on the planet. If human use is doubled twice, we face an ecological impossibility. This would mean no energy left for all non-human and non-domesticated species. If we assume constant per capita resource consumption, the first doubling of population will take place in forty years. In fact resource consumption is increasing, so the time scale will be shorter (Daly and Cobb 1989: 143-4).

2 Scientific predictions about global warming suggest that unprecedented temperature changes (increases of between 2-5 degrees) could occur within the next 50-100 years, with no certainty about the ecological impacts. Per

capita, Australians are among the very worst offenders in terms of Greenhouse gas emissions (Leggett 1990: 59).

3 The international debt crisis has led to $168 billion being transferred from poor countries to rich ones in the five years from 1984-1989. That flow of funds out of poor countries continues each year. Last year it was around $50 billion dollars. For ten of the poorest African countries, debt servicing costs last year were equivalent to 80 per cent of the value of their exports. In the Philippines, debt service costs are equal to 36 per cent of Government expenditure – far more than for all of health, education, and social welfare spending combined.

4 Over one billion people live in absolute poverty – receiving less income per capita than the subsidy given to each cow in the EEC and the USA through inappropriate agricultural policies.

5 The number of refugees and displaced people has more than doubled in a decade. There are over 17 million officially recognised refugees, and countless more millions displaced without being given refugee status.

These few facts alone indicate the multidimensional nature of the crisis. We should realise that something is **very** wrong with what we are doing. Many of us do realise, of course, but we become overwhelmed and immobilised. We drift on with business as usual.

We cannot afford to do that any more. We have to move from what Kenneth Boulding calls the *cowboy economy* to the *spaceship economy*.

The *cowboy economy* assumes an endless frontier and limitless resources. We use whatever we want and discard the waste, leaving it for nature to dispose of, moving on to new land, and fresh resources. "The faster resources are mined, processed and discarded the more prosperous the people are considered to be" (Korten 1990: 37).

The *spaceship economy* assumes that we are all aboard a finite spaceship planet, whose only external input is the radiant energy of the sun. The spaceship has limited

resources to sustain use, so our continued well-being depends upon our finding ways to make most efficient sustainable use of them. It is best to use as little as necessary, limit the waste, and recycle the resources as far as we possibly can. Any resource which is discarded is lost forever. The key objective is to extend the life of products for as long as possible, and develop technology which minimises resource usage.

There are some five billion people on our spaceship living in very different circumstances. I have been working for many years for justice for the poorest of this world. I used to do so because I believed there was something fundamentally immoral in the gross inequities which exist between rich and poor. But now I believe I do it for another reason as well. That reason is that **all** our futures are threatened if we do not share the earth's resources more fairly and use them far more carefully. We do not have to address the problem because of the world is poor. We have to do it for **ourselves** too. We have to save the whole spaceship – there are no life rafts for the few privileged on a spaceship. We all go down together if we go.

We have to start by transforming our thinking about the word *economy*. Economics is the way we organise production and consumption as a society. It has three dimensions:

- money as a means of exchange, and the flows of finance which today are international; this is the accepted view of what economics is about; our economists' goal is to get growth in traditional measures such as the Gross National Product (the sum of all our product activities); but *economics* must also include:
- the arrangements among the people who are doing the producing and consuming; that could be at many scales, from local to global;
- the relationship between the way people are organised and the environmental resource base from which food and goods are produced (Anderson 1991).

At present the (traditionally defined) economics tail wags the rest of the economic dog. For example, thousands of

people are put out of paid work and much of the environment is destroyed for the *good* of the narrowly-defined economy. People and the environment are excluded from the equation. Only money is counted. All of the non-money arrangements in our social system are not recognised (and that, of course, includes a great deal of women's work). Our national budget only gives us a report about money. It does not report to us on the stock of our natural resources and whether that is being depleted or enriched, nor does it tell us about what people are producing and consuming or how they are doing this, or what impact this is having on their well being (as measured perhaps by a range of health indicators – from infant mortality to heart disease, pollution indicators, time spent in meeting our basic needs, time spent with friends and family, or some other agreed measures).

To achieve a sustainable society we have to challenge the economic orthodoxy, whose simplifying assumptions are now so erroneous as to be dangerous, and we have to place economic thinking back into its social and ecological context.

A sustainable society must have an economic system which achieves the following:

- an adequate material standard of living for all human beings on the planet;
- a rate of use of natural resources which is matched by their replacement, so that future generations will have environmental resources available to it;
- a co-operative mode of social arrangements, such that people are not set against each other with the strong gaining access to precious resources and the weak being denied them; and
- free access to environmentally beneficial technologies for anyone who could benefit from them.

Such a system should be achieved through socio-political arrangements which provide:

- a democratic means whereby all people can make decisions as close to where they need to be made as possible;

- a moral, spiritual ethos which recognises that material needs are not everything and which promotes the fullest development of everyone's potential, and recognises the unique contribution which each person can make to society; and
- the protection of human rights.

Eliminating the non-essential

If we are to achieve a sustainable society, we have to re-allocate the world's environmental resources from non-essential to essential uses. For example, a **drastic** reduction in arms expenditure, arms trade and military aid has to occur. The Pentagon alone uses as much fossil fuel in one year as the entire US public transport system uses in twenty-two years. Imagine the precious resources which the whole world's military gobbles up. Australian military spending is an amazing $590 a year per capita.

The problem is that **fundamental** to the way our economic system works at present is the idea that people have wants which are insatiable (and in case you think there is a limit, there are plenty of new products and pounding advertising to convince you – or your teenage children – that there isn't). Economic theory also assumes that nature does not place limits on what we can have – it assumes infinite ecological resources. Now we **know** that is not true.

Furthermore, our society seems to measure each person's value in terms of the material goods at our disposal. Yet to live sustainably, we should value most those who live happily using minimal goods – who find fulfilment without need for so many resource-utilising things. Instead, we should be prepared to assist those in the third world less fortunate than ourselves in material terms. Unfortunately, Australians have been becoming far meaner over the last 15 years, while as a nation we have become much wealthier. We are not modelling a sustainable society at all, because sustainability requires equity.

Australia is an island, and I sometimes think that most Australians believe that we can do what we like on this

rather large island with no thought for the impact that that might have on the rest of the world. If we think of ourselves as on a spaceship, we soon realise the absurdity of such a proposition. At present most of us are using Australian resources at a rate well beyond the sustainable. But our counterparts in the third world are also paying a heavy price indeed for *our* non-essential uses of *their* resources – the loss of the resources to sustain them *now* – let alone in the future.

Some of my colleagues seem to believe that everything will be solved by technology. I hope in some ways that it is, but we have access to the most remarkable technology today. It is the political will, not the lack of technology, which will stop us achieving sustainable development. We have the technology **now** to prevent the 40,000 child deaths that occur unnecessarily world wide every day; to give every woman control over her own fertility; to give everyone access to clean water, but we are not doing it. Why should we believe that technology alone will save us?

It is lack of political will that holds us back. And the most urgent task today is to create the political will. And that is an educational task. That task involves every one of us recognising and acting on the assumption that our choices affect many other people, and ultimately the future of the whole planet. Unless we live with a global perspective, our grandchildren – even our children – may have little reasonable chance of a life at all.

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4 What is sustainability?

Mandawuy Yunupingu

We Yolnu have within our traditions many concepts through which the land teaches us about sustainability. Ganma is one of these. In Ganma is the idea of respect for both sides in any negotiation, but both sides must abide by give and take, ebb and flow. Ganma helps us understand the idea of dynamic balance as something that must be striven for.

For Yolnu the balance we seek is between Yirritja and Dhuwa. These are the two great categories of Yolnu life. Everyone, every place, every concept, every word is either Dhuwa or Yirritja (or sometimes both). Nothing in the Yolnu world stands outside this classification. Ganma is a Yirritja concept. Similar ideas are contained in the Dhuwa concept of Milnurr.

At Yirrkala School we have used both these concepts to inform our work as educators. They help us theorise the education we need for a sustainable contemporary Yolnu life. They have provided the underlying theme in the content and the processes of our new Ganma Mathematics Course of Study. They help us understand a way of working for balance between Yolnu and Balanda.

It may be that contemporary Balanda life does not have balance as its focus, and that is why questions about what sustainability is are currently important. If we take the two great categories of Balanda life to be Nature and Society (everything can be classified either as part of nature or part

of society, with some things being both), we see that it is not balanced. Nature has only the right to be silent. It has to be represented through science which sees nature as neutral and outside society. It is only society which has the right to 'speak' and participate in negotiations.

But people tell me that Balanda have in their traditions ways of understanding nature in different ways than merely as a *bag of resources*. There are old traditions in Western life where nature is able to *speak*.

This is not to suggest that we should turn the clock back. It is to suggest that, just as we Yolnu are using our old traditions to inspire us to meet the challenges of contemporary life, so too can Balanda. Balanda need to find those inspiring elements in their own traditions. And just as in our educational theorising at Yirrkala we have used Balanda ideas and concepts in association with our own traditions to inspire us, so too Balanda have the option of asking us to join them in their own search for inspiration to meet the challenges of developing a sustainable society.

5 Sustainablity – the long view

Miriam-Rose Ungunmerr-Baumann

There are four points I want to make at the beginning:

1 For forty thousand years Aboriginal people have maintained a *sustainable society*. Its very duration is proof of its sustainability.

2 As a traditional Aboriginal person, I will attempt to draw on my own experience to discover some *key elements* that made my society sustainable.

3 I will examine these elements and their underlying values and see how they relate to modern society in which I find myself living.

4 I will then attempt to show what part these elements must play in Aboriginal Education towards preserving this sustainable society for my people.

I am well aware that culture, my culture, must grow or else die. It must be an authentic cultural growth.

I have been thinking over what I have learned from my parents and my family group. It is summed up in the word *culture*. I learned how to look out on my world, the country and the bush. I listened to the wonderful stories that told how everything came into being – the hills, the water-holes, the rivers, the places of importance and the stories that went with them. My life was filled with beautiful stories. My people could not read. They did not write. They remembered and they told and re-told. Interest was always

fresh like a new discovery. My birthdate was given to me by Bureaucracy – 1st July 1950. I do not know the actual date of my birth but I do know of a special place to which I am bound, where I became a living being.

The countryside was somehow part of me and I was part of it. It was filled with named places and I came to learn so many of them. It was my home. It was me.

I watched my people preparing for ceremonies. We were deeply interested in these, even though we could not take part in all of them. Those we were involved in meant complete involvement of the whole group. I never felt alone in these ceremonies. I belonged.

I watched the men make dugout canoes for fishing in the rivers and billabongs. I watched them make their three pronged spears for spearing fish, and their shovel spears for spearing kangaroos and wallabies, and also, at times, for fighting. I watched them spearing fish at night with paperbark torches held high. I saw them diving to catch fresh water turtles in their bare hands.

I was shown how to follow tracks and challenge the cunning of the animals. Bush tucker was my natural food – bandicoots, blue-tongued lizards, rock pythons, porcupines. I waded into the billabongs with the women to gather water-lily stems and seeds. I watched the men catching ducks and geese. I sat beside the women as they dug up yams or went with them gathering the many kinds of berries and bush plums. I was taught what to look for at the various times of the year. **I learned to read the seasons**.

I was shown how to tease fibre from the marapan palm tree; to make string from it and from the string, make dilly bags and fishing nets.

Looking back

Looking back now I realise how much influence my family and my group had in my early education, my cultural education. It also makes me realise how real and practical that education was. I learned by *doing* and I *wanted* to do because I could see it was important for my elders and for

me. **We were in the education process together**. Education was **motivated naturally**. **Education was part of life. Education was for living**.

Looking back on these days of childhood, I realise how independent we were. We lived not too differently from the way our people had lived for many, many years before us. We had no house. We lived in a wurley. We had no money. Nature was our bank. We looked after its capital and drew on its interest. The new world that was beginning to invade us could fall to pieces around us, but we would go on. Our social ties were strong. The extended family was the human side of our world. It gave us support. We developed as people by interaction within that family.

Our system was an ordered one. We respected our elders, wise men, medicine men. They held power and authority. As we grew, we were subject to discipline. We may not always have appreciated it but we knew what was expected of us in our social group and in our relationship with other groups.

Education in my society was sustainable because:

- we had a lifestyle adapted to our land;
- we had a strong social system; and
- we were educated by observing and doing within the family group and aided by strong bonds between teachers and learners.

In 1972 and 1973 I taught as a Teacher Aide at the Daly River Mission School. During these two years my interest in art further developed. It became an integral part of my teaching. I encouraged the children to express themselves – their inspirations, their perceptions, their joys, their ambitions, even their frustrations in colour and symbol. Symbols, true symbols, are such wonderful things. They draw on things deep down in you, expressing at times the almost inexpressible. They lend themselves to further and still further meaning. Aboriginal people are people of deep feeling, and symbols are their deepest and favourite mode of expression.

Education for us, in this time and place, does not stop at a set age or at a set standard gained. My sister has six children and is at present in her final year of teacher training. In our past, events took place when the time was right. In today's non-aboriginal society, time is set and all arrangements must be made to fit into that time slot.

For us, education is more flexible so that it is available when the time is right for a particular person.

Our children are not *risk takers*. In their aboriginal ways they must practise and practise to do the correct thing. They are not encouraged to make *guesses*. (What would happen, for instance, if they guessed wrongly about the habits of a crocodile?) It is a matter of survival to be sure before you act. Therefore to make education realistic and sustainable, factors such as these must be taken into consideration in the day to day curriculum.

I referred above to *risk takers*. There must be some of us who are prepared to take risks, to leave the comfort of our family groups to make our way in a society often ignorant and insensitive to Aboriginal culture. I am an Aboriginal Principal of a school in the Northern Territory. I have taken so many risks. I know they have made me a better person but it has been so hard. It will have been worthwhile if it is an encouragement to others to take the road leading to an educated involvement in the wider society.

In my comparatively short life, I am overcome by the suddenness of the deep changes that have come into our Aboriginal world from the time I was a child until now. Almost overnight there came – citizenship, money, houses, supermarkets, transport, alcohol, Missions, Settlements, Associations, Councils, Government interest and Government policies (sometimes contradictory). A new way of living came upon us. We had to make an unimaginable leap from being people *of the beginning* Aborigines to people of these latest times. Europeans travelled a far, far slower road. They had thousands of years to absorb change. I readily excuse them if they cannot understand what goes on inside us.

Looking forward

The time is come for decision making. We must recognise the bitterness and wrongs so many of my people justly feel, as being part of the history of all Australians and we must take positive steps to put it into context. We have it in our power to educate for a future for Aboriginal people but we must do it now.

I conclude by referring to a painting of mine where I use symbols to define the achievement of a **sustainable way**.

The painting shows the path from war and death to reconciliation and progress. Most of the painting is **blank**. Each and every one can imagine how to fill the canvas by combining what is **best in all cultures**. Perhaps it will take many thousands of years to complete the picture, **but we must start now**.

[*The painting by Miriam-Rose Ungunmerr-Baumann referred to in this chapter now hangs in the Council Room of the Australian College of Education National Office, James Darling House, Canberra.*]

6 The problem of cross purposes: the challenge of our generation

Cherry Collins

The theme of this book, *Education for a Sustainable Society*, is not small, light, or easy: it is, arguably, the largest, most significant, most challenging topic for our generation of educators.

Within our formal educational institutions it is also, perhaps, the most avoided topic. The effort to educate about the dangers of our current societal habits and assumptions has taken place largely outside our schools, TAFEs and universities.

As I write, I can see a beautiful calendar with photographs of *nature*. Underneath this month's sensuous photographic composition of mosses, bracken and a rowan tree in the Scottish highlands are the words of an Indian sage telling me to *emphasise the wonder of life* and of *the privilege of Earth life*. Such calendars are common throughout the Western world. I turn on Radio National. The Earth Worm program is discussing the ways in which ant populations can be used to estimate environmental damage. I watch television news and see Greenpeace publicising the dangerous state of nuclear ships mothballed off the northern coast of Russia. A recent issue of the Women's Weekly informed me that those invited to a party in Toorak last month had been enjoined to dress up to a theme of *Greening the Earth*. Sustainable development is even fashionable.

Yet all this publicity through the electronic media, through print, through demonstrations, through paraphernalia, is curiously disconnected from the real and serious business of formal education. True, it has invaded the primary school. We have moved beyond complaints about Greenie teachers at this level, I think. However, it has not become a serious focus at the upper end of school, in TAFE, and in much of the university curriculum. The Toorak party says it all: concern about planet earth is still in the arena of sentiment and warm feeling. It is part of the private side of life, of what we care about in our spare time, of what we see as feeding the soul – but unrealistic. In primary schooling we indulge this romantic side of ourselves to some extent through a sentimental view of childhood, and so some green ideology is acceptable at primary school level. But it is emphatically not part of what we do in education at the serious end of it. Beyond primary school, education has been about preparation for the realities of adult work and life, about *growing up*. We do not yet know how to connect the business of grown up living, the daily routine of functioning in a set of capitalist, routinised, hierarchical institutions, to our concern about a sustainable society. Thus, in spite of our anxieties about planet earth, we have carried on with the old routinised, hierarchical, curriculum at the core of the secondary schools. Further, in so far as we are changing things at post-compulsory level in schools, TAFEs and universities, we are altering them in directions which show an obsession with economic growth and a refusal to face the gravity of the sustainability issue at all.

This is the core of the problem we need to address if we are truly to have education for a sustainable society. We must face the cultural dissonance in which hearts, by and large, lead in one direction, but heads, at least in relation to our country's and our children's future, lead in another. We want sustainability and yet we are desperately working to restore a growth economy. We want our children to understand the interconnectedness of human communities and ecosystems, and yet our vision of what is best for them in the future includes all our current Western trappings – computers, dishwasher, two cars and a job in an engineering

or chemical company. This problem of cross purposes is the challenge of our generation.

While it is a challenge to the whole society, it is a challenge that we as educators in the formal system must now take on our shoulders as a special responsibility. We are the researchers and thinkers best placed to help mainstream culture beyond cultural dissonance and into conceptions of our society and of a worthwhile life which take sustainable development seriously. It is our task to move the issue out of the spare time leisure, informal realm and into the mainstream of education.

We avoid the topic because it is always easier for publicly funded educational institutions to follow rather than to lead. We are hopelessly sensitive to outside political pressures and fear the backlash which follows from taking a stand on issues which are crucial but not popular with the powerful. As public institutions, too, we do have some responsibility to serve the directions dictated by the polity.

Yet we also have a commitment to truth and a concentration of social intelligence. We have a larger responsibility to society's longer term interest than we have to short-term political or economic goals. When society itself is in schism and the mainstream, serious direction is clearly madness in the longer term, it is absolutely necessary for us to shoulder a good share of the leading and thinking.

How, then, do we move beyond this dissonance? How do we bring the debate and action required for a sustainable society into the mainstream? What would it mean if public educational institutions – that is, schools of all kinds, universities of all kinds, TAFE institutions of all kinds – if such publicly funded mainstream educational institutions took education for sustainability as axiomatic? Three sets of questions need to be addressed.

First, how does teaching about natural reality have to change? This question asks us primarily to consider our teaching of the physical and biological sciences, those areas of the curriculum which 'probe' the world of nature.

Second, how does teaching about human or social reality have to change? This question asks us primarily to reconsider our teaching about history, politics, economics, and so call social "sciences" generally.

Third, how do we need to change our teaching about human living, about the elements of a worthwhile life? This question asks us to reconsider both our personal development and religious curricula, and to reconsider the hidden curriculum of the values and priorities underlying formal educational processes.

Education about natural reality

The first question is the one which informal education systems have addressed so effectively. Our sense of physical planet earth, of Gaia (Lovelock 1979), has been altered permanently by our view of it from space and by our recent evidence of its great rarity as a living planet in the universe. We have a new consciousness of the wholeness of our biosphere and the interdependence of its elements. This is a revolution of Copernican proportions. The Copernican revolution changed human consciousness of the earth. Humanity was shaken from a view of the World as the central body in the universe to a realisation that Earth was a minor planet of one minor star in one minor galaxy. The revolution that is in process now (Gould 1989) is the moving of our view of the place of the human species from deserved dominance at the apex of evolution to a realisation that we are but one of still unnumbered, equally specialised, species in a fragile living network, and an out-of-control species which is endangering all else at that.

There are several important components to our dawning consciousness of how we have been distorting our perception of nature. These components have simultaneous (but networking) origins in a number of different strands of twentieth century intellectual debate – in the Critical Theory attack on positivism (e.g. Marcuse 1972), in feminism (e.g. Fox Keller, 1985), in Christian ethics (e.g. Birch 1976), in the scientific community itself (e.g. Commoner 1972; Barns

1984). Becoming aware of, and moving beyond, these distortions is essential to education for a sustainable society.

First, scientific empiricism, in attempting to move beyond *superstition* as part of the great project of the Enlightenment, gave priority to the observable, the countable and the measurable. The world of science was to be cut off from the world of other human ends, from the appreciation of beauty, from the creation of the good society, from any consideration of values. We have been deluded into thinking that it is possible simply to *stick to the facts* and be objective and neutral. In the process, scientists have been distorting reality by prioritising only what can be seen and measured.

Second, we have taken a mechanical approach to understanding nature. We have treated components of biological reality – birds, trees, amoebas – as separate machines. The mental tools we have used – measurement, simple cause and effect chains, systems of energy and work – assume the machine-like operation of nature. The most prestigious science, physics, is the one which has had greatest success with the machine analogy. Machines have several characteristics: they are dead objects and the whole is no more and no less than the sum of the parts. This machine analogy distorts even physics and has put dangerous blinkers on our understanding of the biosphere as a complex, intercausal, living, whole.

Third, we have had a preference for attempting to understand by breaking natural reality up, by dissecting and dealing with parts. Our scientific culture prefers analysis to synthesis and it has preferred keeping physics separate from chemistry, separate from microbiology. Further, physics has been seen as the basic science, the ultimate science through which all else, by a process of reductionism, may ultimately be explained.

Fourth, and last, we have been viewing, and treating, natural reality as if we were separated from it. It is no accident that science arose in Western culture, a culture in which mind has been seen as a separate entity from the body, as superior to the body, and as unique to human

beings. We have little consciousness of ourselves as, basically, mammals. The scientist has been a mental worker who has treated natural reality as if it were out beyond him; there to be labelled and manipulated; there simply to be used for human purposes.

What does our new awareness imply in relation to education? Part of the answer, surely must be that, rather than continue in a technical apprenticeship mode assuming the neutrality of traditional scientific practice, science education must include the discussion of underlying assumptions and the exposure of those traditional, distinctive scientific values which have Earth-lethal consequences. A more positive part of the answer must surely be to teach for an holistic understanding of natural reality – of ecosystems, and sub systems and of part-part relations and of human observers who are inescapably part of the Nature which is being observed. A third part, for those more directly involved in scholarship and research, must be the recognition that science cannot escape the urgency of developing new philosophical and methodological bases which support sustainability.

We have got somewhere on this educational agenda (Fisher and Hoverman 1989). Ecology courses exist in schools and degrees in this area are an option in universities; the 1980s saw an unprecedented level of critical discussion of the fundamental assumptions of Western science. But we also keep the old physics/chemistry/*double*-maths habit as the prestigious way to matriculate; it is still unusual for science students at university to have to study the assumptions underlying their training; and the enormous, old fashioned, scientific research system grinds on. The schism in ourselves is echoed strongly in the scientific heartland of education.

Education and social reality

The second question posed asks for an appraisal of teaching about social reality. If we are to develop education for a sustainable society, this is the most important question for us right now. This is the black box we must open up

next. If our new understanding of the fragility and wholeness of planet earth, of natural reality, is an irresistible force, our current way of understanding how social reality works is the immovable object (Milbrath 1984). This is the bedrock of our dilemma. What we believe is necessary for our survival biologically, clashes with our beliefs about modern human society and how it must work.

This clash is most obvious when we look at the economic beliefs which many in our business community treat as natural law and which massively influence our behaviour towards the environment. We are frightened daily into a superstitious dread that unless we follow right-wing economic rationalism, in which growth of GNP, free international trade, and unfettered entrepreneurship are axiomatic, we will end up a banana republic. No one mentions that mesmerisation with GNP (avoiding discussion of the distribution of goods), free international trade, and unfettered entrepreneurship are precisely how banana republics in the past have been created.

I do not intend to go into details about the absurdity of a logic which treats *the economy* as if it were a natural object in the service of which we and the whole of life on earth should be sacrificed. Writers from Schumacher (1972) to Daly and Cobb (1990) have written illuminatingly and with eloquence about how economic theory needs to be, and can be, altered. There is plenty to teach here if we care to educate ourselves and to have courage.

Instead, I wish to focus on higher order observations about our teaching on social reality, observations which might help us escape our current attitude towards the economy.

Economic rationalism did not suddenly happen. It is a culmination of a number of beliefs buried deeply in our culture. All these beliefs are irrational. Our dangerous and irrational beliefs include the following:

- A myth of a march of historical *progress* which we see in conveniently limited terms. It is about progress in

technology, the conquest of nature for human use, and in the accumulation of material goods.

- A myth that individual life is about *getting on*, getting on competitively and alone in a hierarchical career which is tied to the growth economy. This is *progress* for the individual. Given that the real end point of each individual life is not achievement, but death, the parallel with the myth of societal progress looks a bit ominous for human history.

These two views of progress have together utterly irrational consequences which have been well put by Mumford (1968: 173).

> ... there is only one efficient speed: faster; only one attractive destination: further away; only one desirable size: bigger; only one rational quantitative goal: more.

Related to the progress view is a third myth: that technology has a developmental path of its own, a trajectory which just happens independent of human decision or will. It is natural, like the hidden hand of the market. Jones (1982) calls this *technological determinism* and it is, of course, also nonsense.

It is important to note that these myths about progress, about the meaning of human life being to get on and achieve as an individual, and about technological determinism – these are beliefs which are particularly prevalent among the male sex. There is pressure to assent to them and to live by them as proof of one's masculinity. Uncovering them and depowering them through education about them is therefore particularly important in the education of boys.

Economic rationalism, then, brings together a set of myths which have grown strong in our society over the last few hundred years and which run very deep. This is my first general point about social reality.

My second general point is related to what we need as educators to do about these dangerous myths. It is that we must help our students to get out of the error of treating social reality as if it were natural. Social reality is created by

human persons through history. All that constitutes social reality – our institutions, our habits of relationship, our ceremonies, our beliefs, including our beliefs about how goods and services ought to be exchanged, and the very language in which we think and argue and create these ideas – all this is not natural and not inevitable. We therefore do educational damage to our students if we teach about our society as if it were natural.

All societies treat their own beliefs as normal and natural in one sense. But we have gone further. The labelling, manipulating mentality of physical science was transferred to social reality in the late 19th century. We can trace this in the disappearance of the name *moral sciences* and its replacement by the name *social sciences*. There was a new ideology, which hoped that social reality could be reduced to physical cause-effect laws and mathematical formulae, an ideology called positivism. While this view has not served the natural sciences well, its effect on our understanding of society and culture has been disastrously disempowering. School curricula have treated social reality as if it were a set of neutral out-there facts to be swallowed. (Australia was founded in 1788; the great Australians were white male explorers, white male governors, white male squatters and industrialists. Economies work naturally through free trade, monocultural production, and so on). In Western Australia we have a Year 11 economics curriculum which, far from teaching students to be literate and thoughtful about economic issues, feeds them right wing economic ideology largely as if it were natural, unquestionable truth, a simple collection of facts. It is no accident that economics, the area of social enquiry which is getting us into most trouble in relation to a sustainable future, is the most positivist social science and the one least able to question its positivist assumptions.

If we are to free ourselves and our students from the paralysis of our current dilemma, we must begin by becoming conscious of the boundary between the social and the natural. Social reality is created through human purposes, decisions and efforts in a context of humanly

created values and meanings. It is created through the use of power and the pursuit of interests, not by nature. It can be changed. Our students must be aware that they can take part in that change process. This is our only hope.

Referring to the need for a revolution to create a sustainable society, Ruckelshaus (1989: 115) writes:

> ... [former cultural] revolutions were gradual, spontaneous and largely unconscious. This one will have to be a fully conscious operation ... If we actually do it, the undertaking will be absolutely unique in humanity's stay on the earth.

It is because the sustainable society revolution has to be a conscious one that education has to play a pivotal role. We have developed new levels of individual self awareness, in the post-Freudian society. The crucial question is: Can we, through education, develop a new level of societal awareness in which we can look at the fundamentals of our culture and, building on our better Christian, communal, and democratic traditions, discard the progress growth myths that are destructive?

Education for living

The third basic question was how do we educate for the process of living a worthwhile life. In the space here, this question can only be addressed briefly.

Under the second question, I have already introduced some of what needs to be said. My concern to free students from a sense that social reality is natural and inevitable is central to this third educational issue too. If one brings people up to see current social arrangements as *scientifically* valid, then clearly one brings them up to be passive and one contributes to the continuation of the dangerous *status quo*. One gives, not just a message about social reality, but about appropriate, *rational* behaviour. Changing this message is essential to freeing young people to work for a sustainable society.

There are two other very brief points related to the third question. Both concern the hidden curriculum of schooling.

The first point is that our myths about social reality are refracted back into that hidden curriculum and that these myths give bad counsel if we want a sustainable society. The reason that we can do cute ecological projects in primary school but get on with physics and chemistry in Years 11 and 12 is because individual careerism, the view that life is about getting on competitively in a material sense, has been embedded in our upper secondary schooling structure for the whole of this century. Economic rationalism is making it worse. In my home State we have just introduced Pathways in Years 11 and 12 (Hallahan 1991). All learning must be done within the assumption that life is about a career direction. Is this an adequate view of how one ought to live for us to be, literally, locking young people into at this point in human history? The Finn Review (Australian Education Council Review Committee 1991) pushes in the same values direction. I am extremely concerned that professional educators and their organisations resist this narrow view of what an education is all about. If this book on a sustainable society heightens our awareness of why competitive careerism is alarmingly dangerous as a value base for education, and strengthens our will to oppose it, it will have made a worthwhile contribution.

Second, people can only cope with the questioning of the beliefs which guide their lives if they are part of a community in which they feel accepted, supported and secure. If we must educate for change, then we have to address all aspects of our educational institutions which either subject young people to arbitrary discipline, attacking their psychological safety and sense of personal value, or which foster the sense of self as an island in a competitive sea. Can schools and tertiary institutions provide the safe communities in which people can grow and from which change can spread?

Conclusion

The social and individual dissonance between heart and head – the focus of this chapter – is something of which young people are strongly aware. They see our current societal trajectory as leading towards a dead end,

particularly for them (Young 1990: 198-201). They are also taking the brunt of our economic adjustments, adjustments which many of them see as being justified by false or shortsighted arguments. There is a strong relationship between our current bland, mainstream, educational curriculum and the despair of youth.

As professionals in mainstream education, we cannot duck the issue of education for a sustainable society. We have a special responsibility to help break through the impasse because we are necessarily accountable, on a daily basis, to this next, aware, generation.

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7 Teaching and modelling good environmental practice

Josefa Sobski

In a broad sense, this chapter examines the theme of education for a sustainable society from the perspective of an educator and an educational administrator. I am proposing a critical educational practice in policy formation around curriculum. In the process, I touch on some dilemmas facing policy makers and practitioners. I cannot pretend to tackle the theoretical issues since, in the case of the content of curriculum, the debate about appropriateness continues to rage unabated and the issue of relevance – to what and for whom – remains controversial. Pressures are increasing to vocationalise the curriculum of schools so that its content is more hospitable or better relates to the needs of industry and commerce. It is this pressure which potentially presents the most potent threat to the expansion of environmental consciousness.

The agreed national goals for schooling in Australia, as expressed in the 1991 report of the Australian Education Council Review Committee (hereafter referred to as the Finn Review), incorporate some fine sentiments which few would wish to contest. Their order of priority or their relative emphasis on one set of ideas as opposed to another could be debated. What they represent is a national compromise between interests and concerns, some inherited and others newly created, to meet newly identified concerns.

The fourth goal of the Finn Review asks schools "to respond to the current and emerging economic and social needs of the nation and to provide those skills which will allow students maximum flexibility and adaptability in their future employment and other aspects of life". The sixth goal asks schools to develop in students "an understanding of and concern for balanced development and the global environment".

The issue of sustainability is not raised. Development is not posed against the global environment because it is *balanced* and thus there is presumably a harmony of interests, a partnership in action. Of course, it must be noted that schools will also aim to develop in students "a capacity to exercise judgement in matters of morality, ethics and social justice" so that they may eventually possess the critical acuity to challenge notions of development whether balanced or not.

The extent to which the setting of national goals influences directly the content of curriculum or can control curriculum and teaching and propel it in State determined directions is a matter for ferocious and fertile debate. Few would argue, however, that it has no influence. With that in mind, it is somewhat disappointing that the national goal in relation to the environment is so innocuous, so neutral, so balanced and ultimately so agreeable and comfortable. Its translation into curriculum content by syllabus developers across disciplines or key learning areas would provide invaluable insights for the researcher into the potency of goals and their capacity for transcending discipline boundaries and penetrating content.

Of course, it must be acknowledged that much work has been done already in some traditional subject areas as well as under environmental education. (TAFE in New South Wales offers courses in environmental management, science studies, and the Universities offer a range of degree programs.) None of this goes far enough because it has variable or little impact on a range of other subjects or courses whose content may conflict with environmental values. In other words, we are working at the margins.

In the TAFE system, there is perhaps a more formidable challenge because TAFE, more than any other sector of education, embodies vocationalism, educating and training individuals for occupations. The knowledge transmitted and the skills taught can be highly industry specific or trade specific, segmented or stratified. It has asserted over the years, its responsiveness to the needs of industry and commerce as its most fundamental merit. Though it has fallen short, at times, of industry's and government's expectations in this regard, it has striven to correct shortcomings and now, more than in any other era, the burden of national economic reconstruction is being placed on its shoulders.

In this sector, curriculum is therefore most closely related to industrial needs and training for technological changes. The involvement of representatives of industry in curriculum development is accepted practice. Facilities sharing is common so that the venue for training may be the shop floor or factory workshop. Teachers are encouraged to return to industry for the upgrading of their skills or to familiarise themselves with new industrial processes and methods of working. This level of involvement is enshrined in policy and even in legislation.

In the national policy framework, greater industry involvement in TAFE courses and facility provision has been fundamental to resource agreements signed with States.

TAFE is regarded as the major trainer for restructured or restructuring industries and the education sector best placed to enhance the enterprise culture.

It is also well placed, for these and other reasons, to make a significant contribution to promoting industrial practices and processes for achieving ecologically sustainable development. But, because this implies the adoption of a critical position of the dominant tendencies in the content of TAFE curriculum, it may be regarded by some policy makers as undermining the prevailing policy positions aimed at equipping workers to become more productive, flexible, adaptable and skilled. Challenging developments

within the economy, technology and labour processes, and how these contribute to environmental degradation, may undermine these policy directions, but it may also lead to better more ecologically sustainable industry developments with an environmentally caring workforce.

It will not be easy to make an ethical penetration into the content of TAFE curriculum and the process of its development so that materialistic, market-driven, industry dominant orthodoxies may be questioned. The environmental (and social) implications of what is taught in a vast number of TAFE courses are extensive. While governments have focused on schools as the venues for raising awareness of these issues, the TAFE sector has been neglected. The need for TAFE curriculum, which reflects concern not just for the needs of industry but also for the environment and accounts for the inter-relationship and interdependence of both, is essential to any national education strategy for ecologically sustainable development.

The TAFE system has again been placed under scrutiny by the Finn Review of young people's participation in post compulsory education and training. In an extraordinary leap of the Committee's collective imagination, the report unwraps for the nation a merger of general and vocational education surprisingly titled *General Vocational Education*. With this concept of GVE, it promotes the need for greater school, TAFE, training "collaboration and co-ordination" in curriculum development.(Finn 1991: 73).

This greater collaboration is designed to achieve greater vocationalisation of the curriculum of schools, which has been analysed and criticised over the years as generally either hostile or indifferent to the requirements of the world of work and to the needs of industry and commerce for a range of skills in their workers.

The Finn Review distils this vocationalisation into key areas of competence which it describes as meeting "Australia's need for a more highly skills workforce which is able to operate more flexibly and with greater innovation at all levels" (Finn 1991: 43).

These key competencies are to be *employment-related*, according to Finn. As with national goals, it is difficult to quibble with the list, but there is an overwhelming sense that the aim of instilling or achieving these competencies is to ensure that students emerge from our educational institutions with a positive attitude "to production and wealth creation" (Ball 1990: 94) to progress and development, to economic and industrial growth. The report resonates with this view.

Under cultural understanding in the key competencies, there is a requirement for this to include understanding of major global issues, and the example cited is that of competing environmental, technological and social priorities. We may take some comfort in the acknowledgement of priorities in competition.

There is also comfort in the fact that the Finn Review acknowledges that TAFE courses must encompass more general educational concerns.

In parallel with the Finn Review, are a plethora of policy making activities aimed at rekindling concern for vocational education and training and "the need for training arrangements to be linked more directly to the requirements of industry and to meet the demands of award restructuring" (Finn 1991: 12). For instance, a National Training Board has established the Australian Standards Framework and Policy, and guidelines have been issued for the TAFE sector. As part of this structure, there are two sets of standards – occupation core standards, which include broad-based competencies in numeracy, literacy, occupational health and safety, and communication within an occupational context. There are also some broad technical competencies which may be included here as determined by the industrial parties (welding skills, for example).

The second set of standards relate to the industry core which includes competencies required for specific industries.

In this context, it is vital that competencies associated with the reduction of waste, the conservation of energy, the

promotion of energy efficiency, the re-use and the recycling of materials, the causes of environmental degradation, the valuation of environmental assets, and so on, become core competencies for multi-skilling and upgrading the knowledge and understanding of workers.

In an overall sense, the more schools become vocationalised, the more important it is for the curriculum's relationship to the environment to be elaborated, to be at the core of the goals and purposes of schooling.

The more colleges of TAFE collaborate with schools, the more vital is the establishment of core skill standards for environmental protection and conservation and ecologically sustainable development.

It is not just the teaching of good practice, however, that is important. Our educational institutions must also become models of good practice. As beneficiaries of public wealth, our institutions need to examine their operations and the nature of their consumption of material resources.

In this regard, we can all admit we have a long way to go. We are not immune as large consumers of resources to the problems facing other government and community agencies in dealing with waste, recycling, reprocessing, energy conservation, and so on. We are constrained by more pressing priorities and severe limits on expenditure which is aimed at long term solutions to maintenance problems.

In my TAFE college, which is located near the Parramatta river between Ryde and Concord, the problems of implementing environmentally sensitive policies and practices are confronted daily. The college facility is spread over eleven hectares and incorporates a former school site. The buildings are constructed to interrupt or divert natural run-off so that there are severe drainage problems at various points. The former schools' oval is a bog, trapping water running off the north eastern end of campus. Other parts of the site need constant watering during the summer. The site is only partially landscaped and tree planting has been sporadic, although some original vegetation is preserved in small pockets.

Buildings on the site range in age from four to forty-three years. Different architectural styles intrude upon each other. No alternative energy sources are used. Many buildings are very energy inefficient, being totally reliant on electric lights all hours of the day. The use of toxic, flammable and non-biodegradable substances is common place in teaching of courses in fine arts, automotive electrical, biological sciences, applied sciences, boat and ship building, applied electricity, electrical engineering, fitting and machining, hair dressing, welding, and panelbeating.

While recycling or re-use of substances and materials is practised, the rationale is usually saving funds, not saving the earth. In the building trade, wood is still the primary teaching resource. The carpentry and joinery trade students in some states learn skills on *live work*; in New South Wales models are still extensively used in teaching. Teaching practice is trapped by slow progress in building technology.

In other disciplines like fine arts (print making and photography), advances in chemical technology have resulted in the introduction of new toxic substances. Their safe disposal, not to mention use, poses problems, particularly in buildings designed prior to the introduction of new processes and technologies.

The NSW Department of Public Works has recognised, for some years now, its moral and social obligations in the design and construction of our educational institutions. Recently it canvassed a broad spectrum of opinions in a seminar on innovation in learning places. A wealth of ideas emerged from the seminar. Key concerns were energy conservation, energy efficiency, solar energy systems, natural ventilation and lighting as key elements of design, landscaping for sun control, energy self-sufficiency through recycling of wastes, on site sewerage processing, creation of sites for environmental research and experimentation, adaptable building designs for conversion to other uses, and utilisation of roof areas.

There are some key principles which need to be applied – simplicity in design and sophistication in technology,

economy in the use of materials, efficiency in energy management, sensitivity to the environment.

Performance measures for environmental accountability need to be introduced across institutions. These may at times be incompatible with other measures for quality and efficiency in operations. What may be appropriate short term, financially attractive solutions to problems may have high costs environmentally in the long term. The well being of present day students may be at a cost to the welfare of future students or the community at large.

The introduction of measures for environmental accountability needs to be undertaken with the objective of "sustainable management of resources, of using resources while at the same time conserving them" (Pearce *et al.* 1989: 3). The environmental costs of our decisions need to be assessed and the benefits weighed against them. This kind of analysis needs to be integrated with all decision making and not confined simply to large investment decisions where environmental losses or damage are obvious.

In order to implement objectives to achieve environmental accountability, we need to accept that our patterns of consumption, expenditure, investment and development will need to alter. Our assets may need to be valued in a different way, the natural and capital assets.

Each institution may develop unique internal standards depending on its assets and its resources flexibility. Key objectives might be the following:

- recycling of paper and other products
- reuse of materials
- reduction of waste/garbage
- reduction in demand for paper and other materials
- elimination of pollution in the disposal of air borne particles from workshops and laboratories
- replacement of toxic substances in teaching
- power efficiency and conservation in heating, cooling and lighting
- water conservation through reticulation and storage
- investment in alternative energy sources

- use of recycled materials
- greening policies for the campus
- purchasing policies which support environmentally sensitive producers
- mechanisms for redistribution of educational resources used by students

In this approach I have assumed that issues raised about the usefulness of performance measures would be debated separately. An environmental management plan, however, may be devised independently of what use or value one places on measures attached to its objectives. These somewhat obvious ideas are tentative ventures into what must be integrated into an institutional policy framework. We cannot preach a consciousness we do not practise.

Concluding note

The generation of wealth through economic development will end in the expansion of poverty if we do not curb the excesses of so-called advanced societies. There are cross national interests which require promotion and protection from the profligate and rapacious consumption in western societies. Growth in incomes for the few will not better distribute incomes to the many. Our own quality of life must not increase at the expense of other societies and nations, nor of future generations.

Our education system has an important role to play in teaching and modelling good environmental practice which will contribute to a sustainable future.

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8 How should the future look?

Susan Ryan

The new challenge that our society has taken upon itself, developing a sustainable society, will impact dramatically on education systems and all who work in them. This will happen in the way that other great social movements have impacted on the education system. Whether we are discussing the past, the present or the future, there is one constant: whenever society faces a new set of complex challenges, whenever new demands emerge from the community, government or the economy, the education system, in all of its manifestations, is expected to provide the answers. Whether this is fair or reasonable is not really relevant. The demands are made and the system always responds, with more or less success, sooner or later.

The Australian education system, despite its current and, I hope, continuing failure to fit the economic rationalist model of a deregulated industry proposed by the Industry Commission, remains the central institution through which major social objectives are identified and the most effective agency through which changes, once adopted by a society, are interpreted and implemented.

The philosophy of a sustainable society and many of the elements that will constitute it, have been extensively canvassed in preceding chapters. How far have we got in defining an education system to support a sustainable society? To what extent is education currently responding to

the challenges of developing a sustainable society and what changes need to take place if our future is to be sustainable?

The discussion about content suggests to me that we are again facing a period of massive reform. We need to reform not only the content of education but also the way in which education is delivered. If we look at the major environment problems facing Australia, let alone those facing the planet, we can see that they call for a number of things. They call for a much broader and deeper knowledge of science than the community currently possesses. Extensive and good science is required to save our soil from the ravages of salinisation and deforestation; to salvage and conserve our previous and scarce water resources; to ensure that the depradations of traditional farming methods are reversed. The major objectives of conservation groups – securing a future for old growth native forests and regenerating endangered species – require the attention of biologists, zoologists, soil scientists, irrigation engineers, and so on.

If we look at the environmental problems associated with industry and urban development, we see that pollution, emissions, excessive and unsafe use of hazardous chemicals, contaminated sites, extravagant use of energy and water resources, all demand rectification by solutions that involve science and technology. Yet many of those in the public sector, industry and environment groups who are endeavouring to rectify these problems, do not have an adequate science base for their efforts. An examination of the subject choice and content in high schools and universities would suggest that this problem is getting worse, not better.

We need more teaching of sciences and more broadly based science teaching. But at the same time, the demands of a sustainable society provide challenges to social policy, ethics, to public policy generally. Solutions will not be found by science alone. Complex redistributive problems arise. The current high unemployment levels demonstrate the complexity of the challenge. We cannot pursue solutions that will leave a million and more Australians permanently unable to earn income. Again, the sensitive and

controversial area of immigration policy is on the public agenda. Many committed environmentalists are opposed to increasing the population size of Australia, yet many Australians, and I believe most of the education community, are strong supporters of immigration for reasons of social equity and also because of a broader commitment to cultural diversity and richness.

Is cultural diversity less important than biodiversity? These are very difficult questions. How is our education system currently fitted to provide answers? Not very well I must say. It has taken all of my adult life time to get to a point where systematic and serious attention is being paid throughout the education system to improving opportunities for girls and women, and to developing a curriculum and career paths free of sexist content and assumptions. Yet again as opportunities for women seem to be opening up, many critics of the environmental effects of our contemporary lifestyle seem to be suggesting that women should withdraw from their new opportunities and assume more traditional domestic tasks because those traditional domestic arrangements appear to have had a lesser impact on the environment. Again, complex questions of equity, opportunity and social responsibility arise, questions which are not adequately dealt with within current frameworks.

Scientists, technologists, engineers, are floundering in the face of the strong criticism of their activities by those who are accusing them of massive global crimes in relation to greenhouse effect and the ozone layer. The dialogue between the scientifically and technically trained, and those whose education and activities are concerned with social policy, is at this stage very poor.

Although in recent years some institutions have made valiant attempts to achieve interdisciplinary teaching of science and the humanities, those attempts have not reversed the highly segregated approach between science and humanities which has been the basis for our education system at school and tertiary levels for so long. Neither the content nor the organisation of education in Australia

encourages or rewards lateral thinking. Yet linear thinking will not help us to resolve the moral, philosophical, redistributional and ecological questions critical to achieving a sustainable society.

How should the future look? In the future I would like to see education integrating science, technical knowledge and the humanities. By the humanities I mean history, philosophy and literature as well as newer forms of the study of human and social behaviour.

History is important. It is important to know that the world has faced major environmental pressures before. A better grasp of history, particularly the history of the industrial revolution, its environmental and other excesses, and the way in which these excesses were restrained, would provide the basis for more hope and less pessimism about current problems of pollution, emissions and waste management. The deserts of Africa have not been created by twentieth century industry or mining. Irrigation, the better management of scarce water resources, is an activity that human societies have been engaged in various parts of the world for many thousands of years. We need a broad based humanities/science synthesis to assist us to think about problems intelligently, and then to have the courage and techniques to solve them.

My advocacy of integrated education has, I realise, huge implications for school curriculum, university entrance criteria, and the organisation of university teaching and research. I do not believe, however, that such reorganisation is actually impossible. There are some encouraging signs. Many readers could give examples from their institutions. I have been encouraged, for example, by a development at the University of Melbourne with which I am associated. The Philosophy Department has established a Centre for Philosophy and Public Issues. The Centre allows expert philosophers to bring to bear their highly developed capacity for thought and analysis on a range of complex issues: environmental, business ethics, medical ethics, and so on. I am pleased to see the philosophers brought into active

participation with public policy, which had been deprived of their input for some decades.

I am also a strong supporter of the movement to bring the creativity and expertise of our design community into a working relationship with manufacturing industries, particularly with the new ecological industries that are developing in pursuit of a sustainable society.

It has long seemed a disappointing irony that although our design schools attract gifted and ambitious students, and talented and dedicated staff, poor performance by our manufacturing sector persists as a result of poor design. In the future, designers should not be seen as an optional extra in any manufacturing process: they should be integral to it. The new ecological industries are a promising indication that this is starting to happen. Companies which are able to invent cleaner and better ways of doing things, more energy efficient ways of operation, companies which are able to reverse the effects of pollution on water and soil, and to recycle energy and materials, are companies which are integrating design, science and ecological values in an exemplary fashion. They are utilising the best of available knowledge, rather than retreating from it.

If we can move from the present to a future education system that integrates, synthesises, makes problem solving at the highest level a major objective, utilises creativity in all disciplines and liberates creativity through interdisciplinary teaching, then we have the basis for optimism.

The set of challenges a sustainable society provides to education in the future is huge, perhaps as big as anything that has come before. But I wish to conclude by speaking of another set of challenges. Many people, and the education community in general, took upon itself some magnificent challenges in the 1970s and the early 1980s in this country: the challenge of equity, of changing education so that no group was excluded for social, ethnic or economic reasons; the challenge of developing education for a multicultural society; the challenge of democratising what had in most cases been an authoritarian and exclusive model. It even,

somewhat belatedly and not quite as universally, took upon itself the challenge of creating education which would provide the best and equal opportunities to girls and boys. Some of those challenges were substantially met. Many remain.

My final suggestion is that in pursuit of a sustainable society, with all of the challenges (technical, philosophical, organisational, and ethical) that this pursuit creates, we do not abandon the objectives of the 70s, nor assume that they are fully or permanently achieved.

Education for a sustainable society should also aspire to an equitable society and a democratic society.

9 Social literacy and a sustainable future

Frances Christie

My observations on a sustainable future are shaped primarily by my own professional preoccupations as an educationist with matters relating to the teaching of English language and literacy. Recently I passed to the Minister for Employment, Education and Training a Report prepared for the Project of National Significance on the *Preservice Preparation of Teachers to Teach English Literacy* (Christie 1991). This Report had been called for by the Minister as one of the initiatives of the International Year of Literacy. Much of what follows is influenced by my work in that Report.

In this chapter language is discussed briefly in three senses:

- language as a technology;
- language as literacy;
- language in the construction of information.

I want to argue that in any account we may offer of desirable patterns of education looking towards the 21st century, we must press for development of programs that stress the importance of language in the construction of experience, knowledge and information. We must press, too, for the growth of educational programs which teach for a great deal of explicit control and understanding of the resource that is language. Language is so often taken for granted that its role in the contemporary world is regularly not properly acknowledge. Yet language is fundamentally involved in the daily building of experience – most notably

in the building of information. It is a matter of educational equity and social justice that we seek to develop educational programs that ensure very high levels of understanding of language and capacity to use it.

Language as technology

Apparently speech had evolved in the human species over a million years ago. While we can only speculate on how language evolved, we can at least make certain deductions from observations of ourselves as we use oral language, and as we watch its emergence in young children. There are two very general observations I would make about the use and development of language. Firstly, it is a social phenomenon, in that it develops in social contexts, and as a necessary aspect of interacting with others. Secondly, language develops in order to get things done – that is to say, in order to accomplish goals of various kinds. Overall, language develops in material situations, where the demands and needs of shaping and order experience, of achieving control of aspects of the physical environment, of influencing others, and of making sense of the world, quite fundamentally determine the nature of language. In this sense then, language is a technology, comparing in its uses and consequences with the other technologies humans have invented – such as the axe or the wheel, both of which quite crucially changed the capacity of humans to act upon and order their world. However, I would want to add that language must surely be regarded as the greatest technology humans ever invented, principally because its appearance made possible, over time, the development of so many other technologies.

Not all such technologies, it is true, have necessarily been for the collective good: one thinks for the moment, of the awesome nuclear armaments humans have produced this century, or of the extraordinarily sophisticated collection of warheads and other technologies of war recently unleashed in the conflict in the Middle East. To acknowledge the impressive array of technologies humans have created is not necessarily to endorse or admire them all. But they serve to remind us of the variety of ways of acting on the world

humans have invented, all of them built upon other and earlier ways of acting on the world. And all of them were in some sense traceable to the capacities for intelligent action and thought which were unleashed and developed through the emergence of language.

So far, in referring to language as a technology, I have described it in terms of something used for acting upon the world. But technologies are not merely means to act upon the world. Technologies in fact help us construct aspects of our world in new and different ways. That was certainly true, for example, of the inventions of the axe and the wheel, but it must also have been true of the invention of language. One way of thinking about this is to draw a parallel with the experience of young children in the first three or four years of life, as they master the grammar of their mother tongue. The more they know and can respond to ways of using their language, the more their capacities are unleashed to build and interpret a sense of reality. So, too, in the evolution of the human species, we can suggest that the evolution of language unleased not merely the capacity to act upon the world, but also the capacity to interpret and build a sense of the world. Such capacity has continued to evolve, I would argue, so that the technology that is language continues to shift and change in order to accommodate the new meanings of the late twentieth century world.

Language and literacy

If language is itself a technology, then it should be clear that one of the major other technologies its development released was that of literacy. It is worth reminding ourselves that literacy is a relatively recent phenomenon in the evolution of the human species. It had apparently evolved by 4000 BC in Mesopotamia and the Nile delta, by 2000 BC in China, and more recently still in what is now Mexico. The impact of writing, especially after the invention of the printing press, has been far-reaching.

One measure of the significance of literacy in the contemporary world is the enormous importance attaching to it in educational processes. Apart from numeracy, literacy

is arguably the most important capacity conferred on the young in their schooling. The longer students stay at school in fact, the more their progress is established and evaluated in their capacity to read and write. In fact, so great is the significance attached to literacy, that the importance of speech both in human interaction and in learning, is very often overlooked.

In briefly sketching the idea that language is to be thought of as a technology, I have observed that technologies do not merely allow humans to act on the world in new ways. On the contrary, they allow us to interpret and construct aspects of reality in different ways. Nowhere is this more apparent than in the invention of literacy. There are at least two broad senses in which the invention of literacy changed reality, and caused people to think about things in new ways.

The first broad sense is that the invention of literacy generated a need to identify a host of new things – words, letters, punctuation marks, spaces between words, pages, paragraphs, and the like. These are all quite fundamentally part of the metalanguage children need to learn in the primary years of schooling in particular. Development of a capacity to use such a metalanguage changes children's consciousness about their world quite fundamentally, so that they learn to operate in their world in new ways.

The second broad sense in which literacy changed reality is that over time, it brought about changes in the grammar of the English language. Speech is dynamic. It is primarily organised around series of interconnecting clauses, each clause representing some kind of *doing*. Writing, on the other hand, is primarily synoptic. It is primarily organised around nominal or naming groups in which we pack in a great deal of information. To illustrate the grammatical difference briefly here, consider the following sentence, taken from a booklet on drug consumption in Australia:

> *The full extent of the drug program in Australia* is difficult to gauge due to *a lack of reliable, comprehensive and uniform statistics.*

Deconstructed as speech, this sentence would be:

> No-one *can gauge*
> how many people *take drugs in Australia*
> because nobody *keeps statistics*
> that we can *rely on*
> or that we *can comprehend*
> or that *are uniform*.

Note that the spoken version has six clauses, where logical relations are explicitly built between clauses, and where the information is built up primarily in a series of processes realised in verbs.

By contrast, the written version has only one clause, and most of the information is packed in the two nominal or naming groups: *the full extent of the drug problem* and *a lack of reliable comprehensive and uniform statistics*.

Writing turns the activities of speech into the things of writing, in a process known as that of grammatical metaphor. We deploy the resources of English grammar differently in writing from the way we do in speech in order to make the meanings of the written mode. Above, I referred to the changes to human consciousness brought about by the development of a metalanguage to do with literacy. I would add that the capacity to deal with and organise experience in the ways that the grammatical organisation of writing confers, also brings about changes in the consciousness of those who use literacy. In short, both in the life of the individual child, and in the history of the human race, growth of control of the literate mode brings the ability to construct aspects of reality in new ways.

With the invention of writing, humans acquired the capacity to store and amass information – my third theme.

Literacy and information

One of the most impressive, yet least understood aspects of life in the late 20th century world is the burgeoning quantity of information. It is the remarkable capacity for amassing, storing and communicating information which in many ways marks this period of history as most different

from earlier periods. In the periods of history in which humans invented and first used the technologies of the axe and later of the wheel, the commodities they made and exchanged were primarily goods of some kind. But the primary commodity now exchanged in the late 20th century world is information. The use of technologies like the word processor and the computer makes it possible to generate great quantities of information very quickly. Using such facilities as electronic mail or fax, we can also communicate such information to people in New York, London, or elsewhere, in a matter of seconds.

It is for participation in a world where the primary commodities exchanged are items of information that we are educating the children of today. However we conceive a sustainable future, we must assume that the pace of the information explosion will continue. Hence, too, we must assume that very high levels of capacity in language, literacy in particular, will be required for effective participation in the world of the future.

It is of the nature of most technologies that, once invented, we tend to take them for granted, getting on with the things they allow us to do, while ceasing to pay much attention to the ways they operate in order to let us do those things. Yet as already indicated, technologies are not merely things with which we act upon the experience of living in the world: they are things with which we build and interpret experience, hence causing us to change aspects of the world in varieties of ways.

The invention of language allowed humans to build and interpret experience in new ways. The invention of literacy, much later in history, permitted a veritable burgeoning of new forms of knowledge, new ways of interpreting and building experience, and it led directly to the knowledge explosion which is a feature of the late 20th century. It also helped lead to those features of a contemporary world in which the cry has gone out for the development of policies for a sustainable future.

The way ahead

The present pace of amassing and communicating information is often so complex that we do not always understand, let alone interpret successfully, the kinds of information generated in the modern world. The educational system cannot alone address such a problem, but it does have an important role to play. Among the steps we can take is to develop educational policies which stress the importance of developing a high level of consciousness about the uses of that most basic of all our technologies – our language. We must teach our students to be appropriately critical about the ways language and literacy are used to construct knowledge and experience in different contexts. We must teach them to recognise the ways in which language builds values, attitudes, ideologies and ideas. We must also teach them to recognise how the propagation of many values, attitudes, ideologies and ideas can often work to the advantage of some social groups over others.

Above all, we must teach students to see that, in learning to achieve some conscious control of ways of using their language, especially in the literate mode, they can also learn ways to act upon, to reinterpret, and hence to change their world. Unless people learn to control the technologies they have invented, there is a very great risk that they will be controlled by those technologies.

The Report on *Preservice Preparation of Teachers to Teach English Literacy* argues for the importance of teaching for a critical social literacy. I commend to all educators the need to teach for a critical social literacy, if indeed we are to help develop a sustainable future.

Reference

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10 A real world of hope

Barry Dwyer

Reflecting on the theme of *Educating for a Sustainable Society* is no task for the pessimist.

We have to acknowledge some daunting challenges as we consider a world where there is so much evidence of massive environmental destruction, economic and social injustice, international tension, infringement of human rights and dignity, poverty, violence, racism, sexism and the exploitation of people and the places where they live. There can be no doubt that our social, economic, political and cultural worlds are all in need of perpetual regeneration.

A special kind of leadership

The development of educational structures and mindsets in such a way that they may help create a better world, requires leadership of an incredibly high order.

I am not referring here to the important skills of management and organisation, but rather to those qualities which, in changing times, help people to create connections, to understand the unfolding story, to make sense of what is happening in their lives, and to develop a vision of what might yet be.

In this context, one of the most important tasks of any educational leader today is to help colleagues and fellow citizens to identify and articulate the values on which a desirable future can be built.

The real world

As we all know, everything that happens in education is value-laden. Our courses, our frameworks, our plans and our relationships, all reflect the values inherent in one or other of many world-views.

I was reminded of this recently when I received some mail challenging a comment I had made on the competitive/utilitarian ethos that is developing in many Australian schools. We would serve our children better, I suggested, by fostering cooperation, compassion and a sense of responsibility for others rather than more self-serving qualities. This way would lead to the development of a happier and, probably, a more prosperous society.

'Come back to the real world!' urged an angry respondent. 'It's a dog-eat-dog existence out there. Kids have to learn to compete. In the future, the fittest will survive!'

That do-others-before-they-do-you is not uncommon in our consumer society. Many people do not mind a dose of high-ground rhetoric on ceremonial occasions, but in their heart of hearts they just know that money talks, that we are what we own, and that real success is seen in what we produce and in the power we have over others.

Sad to say, in such a *real world*, human dignity is at risk, as are human relationships, not to mention the claims of wholeness, simplicity and solidarity. The values that dominate and set directions for society's institutions, including its schools, in this *real world* are those of having rather than being.

The prevailing mindsets of individuals, *the real worlds* they inhabit, are revealed in the metaphors they favour in describing schooling itself. When people tell us, for instance, that *education is an industry*, that *schooling is like a race*, that school itself is a *small business*, they are offering us a window on their world. Likewise, when they apply the jargon of industry and commerce to our teachers, our children and our classrooms, when the talk of *human capital, attainment targets, performance indicators, market forces, marketable skills*, and the like, they are leading us into a world that may be

very different from the one in which we have traditionally reared and educated our children.

It is important, therefore, to remind them, and occasionally ourselves, that there are other worlds where education is a process which helps people to grow to maturity and autonomy, and where schooling is about belonging to a learning community and where school itself is like a good home. In such a place, the language heard is the language of self-discovery and self-worth, of growth and interaction, and making sense of finding meaning.

Values for a sustainable society

One might well wonder how appropriate the technocratic mindset and its metaphors are for moving our communities from today into a tomorrow where we can celebrate a more sustainable society.

I believe that the values that must underpin such a desired society are deeply embedded in many of our traditional structures and are certainly central to the long tradition of humane and liberal education. In this context, what are held in high esteem are the critical and inquiring spirit, the notion of the total or holistic or all-round development of the individual, a respect for the inner, reflective life, and a view of education itself as a liberating force for the person and for society.

But is that not just cloud-cuckooland day-dreaming? Do the Australian people not demand a much more hard-headed utilitarianism from their schools? Are they not *into* measurable outcomes, comparative scores and marketable credentials?

A colleague, Helen Cannon, and I conducted a simple yet rather extensive survey of parental expectations of schooling in 1990. Over a thousand parents from Sydney's inner and eastern suburbs and lower-north-shore were asked what they wanted school to do for their children. Whether this question was asked in affluent middle-class suburbs, in disadvantaged areas, or in places of very high migrant density, the answer was always the same. Above all of the

basic competencies that school can develop, the parents requested that their children be helped to become autonomous thinkers and self-confident learners; they wanted them to be happy and well-balanced, to be able to solve problems, to be caring and sensitive, to be creative and imaginative. It would appear that the thousand parents saw those qualities as leading, in some way, to *a real world* that would be worth living in. Only when they had firmly established this prescription, did they turn to the so-called *basic skills'*

Positive signs of the times

The challenge of moving from today towards a more desirable tomorrow requires us, then, to clarify our values and allow them to shape our vision.

As we do this, we will be consoled by the realisation that we are certainly not alone. At this very moment, positive signs of the times can be read in every aspect of human endeavour. Look at the influence of the women's movement in pushing us, albeit with some reluctance, to a richer, more generative and more equitable society. Regard the debt we owe to the multicultural movement which, in challenging old racist myths, has greatly enriched communal life. Then there are those who work tirelessly to deepen our appreciation of Aboriginal culture and its capacity to enter into partnership with the land. The environmental movement is reminding all people of their common heritage, the earth, and of the great imperative of our times which is the development of a collective and personal sense of stewardship for the resources of this planet.

The Churches, too, seem to be more effectively linking the religious and the social aspects of life, providing a moral framework for conceptualising the challenges and responsibilities associated with the sustainable society.

This year, my own Church, the Catholic Church, celebrates the centenary of the publication of Pope Leo XIII's encyclical letter, *Rerum Novarum* (*The Condition of Labour*). This is usually seen as marking the commencement of the Church's social teaching in the modern period. Over recent

decades, particularly, these teachings have dealt with such areas as political and economic rights, social and economic justice, and the resources of the earth, global solidarity and the promotion of peace – all essential in a sustainable society.

A second enlightenment

Today there are so many indications of old paradigms and orthodoxies being challenged in every field of human activity – science, economics, psychology, philosophy, just to begin the list. Fritjof Capra talks of the emergence of a new, more holistic, vision of reality. And Bernard Lonergan suggests that we are experiencing a *Second Enlightenment*.

Reflective culture

Those who have the responsibility of leading educating communities need, I believe, to be continually alert to the many positive signs of the times. Some can be incorporated into our educational vision and will stimulate our educational imaginations. Others will be adapted and brought into complementarity. The leader's task is to help local communities to make connections and to find meaning in it all. Today's educational leader must, above all, stimulate a reflective culture and lead the *great conversation* about the purpose of schooling into the contemporary world.

This type of leadership which school communities desperately need at the present time, is far from easy to exercise. A pall of pragmatism seems to have fallen over our educational institutions. There is so much restructuring and refashioning, so many amalgamations, such a plethora of new courses, syllabuses, programs, policies and priorities to be pursued with diligence and alacrity, that there is little time to reflect on where it is all coming from, where it is all going to, and what it all means. To interrupt item 16 on a packed agenda at any meeting and to ask for some discussion on its philosophical underpinnings is akin to throwing a hand grenade into a goldfish bowl; intellectual discourse that might explore motivation and purpose has become intolerable in the fast-lane world of educational

administration. Yet, without adequate contemplation and reflection, our world may well become as far from reality as our critics sometimes suggest it is.

Prophets of hope

The *hard culture* of contemporary consumerism, materialism and technocracy cannot provide a nurturing environment for tomorrow's sustainable society. But it is not the only *real world* in which human beings live. There are many who share a holistic world-view that recognises and celebrates interdependence, global solidarity, a sense of stewardship for the environment and a profound commitment to social and economic justice.

As we read the signs of the times, we find many reasons for hope. Children of the next generation, whose *real world* will be tomorrow, will require above all, prophets of hope – teachers, parents and administrators who will assure them that they are of inestimable personal worth, that things can be better and that, in the long haul, they can make a difference.

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